SULPHONAL AS HYPNOTIC.

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The singular unanimity of experience and opinion in favor of sulphonal as a hypnotic led me to make a series of trials of it upon insomniac patients in this hospital.

The cases chosen for this purpose represented classes of the most obstinate wakefulness, five being complicated by great motor excitement. Fifteen grains each of chloral and potassic bromide would induce no sleep in three of them, and only two or three hours in five; hyosine hydrobromate, gr. $\frac{1}{10}$ — $\frac{1}{20}$, none in two and about three hours in four.

The drug was taken as a powder, usually at bedtime, ninety-five times by fifteen different patients suffering from insomnia arising in the course of chronic mania in three, acute mania in two, chronic melancholia in five, acute melancholia in two, and of dipsomania, recurrent insanity and general paresis in one each.

If six to nine hours of continuous sleep be the measure of an excellent hypnotic effect, four or five hours a fair one, one to three and one-half hours an imperfect,—then the result, as a whole, was excellent in nine cases, fair in two, imperfect in four; of the whole number of doses excellent in 36 per cent, fair in 27 per cent, imperfect in 32 per cent, useless in 5 per cent. Of the five greatly excited cases the success, as a whole, was excellent in one, fair in one, imperfect in three; of the thirty-one doses taken by them excellent in 23 per cent, fair in 26 per cent, imperfect in 35 per cent, useless in 16 per cent.

Of the ten quiet or mildly agitated cases it was excellent in eight, fair in one, imperfect in one: of the sixty-four doses taken by them excellent in 42 per cent, fair in 27 per cent, imperfect in 31 per cent. In summary, an excellent or fair hypnotic effect was obtained from 63 per cent of the whole number of doses, from 49 per cent of those taken by greatly excited patients, and from 69 per cent of those taken by the quiet or mildly agitated. All the total failures occurred among the former class.

Drowsiness or distinct somnolence was noticed as after-effect in four cases. The efficiency of equal doses seemed to be increased on successive nights, or prolonged to the next, in ten cases. Apparent loss of power was noticeable in one. The interval before sleep was usually one-half to two hours.

Of fifty-one *fifteen* grain doses 24 per cent had excellent effect, 29 per cent fair, 39 per cent imperfect, 8 per cent none; of thirty-nine *thirty* grain doses 51 per cent excellent, 26 per cent fair, 20 per cent imperfect, 3 per cent none; of five *forty-five* grain doses 40 per cent fair, 60 per cent imperfect. The latter dose was given only when thirty grains failed or were imperfect in action.

These percentages tend to show that sulphonal is an efficient sleep-producer. How much collateral disturbance is excited by it could not be accurately determined in this series of observations, by reason of incoherence, excitement or unreliable tendencies in the patients. Therefore it was decided to complete the inquiry by noting its effects upon normal persons.

Six officers and attendants were found willing to make the test. Sulphonal was administered to them in five ounces of hot water within an hour after a meal on three successive days at the same hour. Pulse and respiration were recorded half hourly during the first three hours, thereafter hourly until 10 P. M., and just before rising in the morning; temperature hourly after same plan. Special attention was directed to its hypnotic power, stimulation, depression, headache, vertigo, nausea, changes in pupils, condition of skin, dryness of throat, thirst, interference with appetite, digestion, action of bowels, muscular relaxation or motor disturbances. In four cases the urine was examined before and after the experiment.

CASE I.—A. B. M.; man; aged 25; weight 187. Fifteen grains at 7 P. M., no effect; second night same dose, slight drowsiness during the next day; third night *thirty* grains, marked drowsiness, drooping and puffiness of eyelids within an hour, increasing until bedtime. He slept soundly all night, awoke at usual time in the morning with feeling of tightness through temples, and felt dull and irritable all day. He passed 25½ oz. of urine during the first twenty-four hours, 40½ oz. during second, 68 oz. during third; no chemical change; average normal amount, 51 oz.

CASE II.—H. G. H., man; aged 21; weight 195. Fifteen grains at 7 P. M., no effect; second night same dose, within two hours, drowsiness, slight vertigo and difficulty in coördinating movements of lower extremities, which was felt for two hours of the next forenoon; third night *thirty* grains, within three-quarters of an hour distinct drowsiness, drooping and puffiness of eyelids, increasing until bedtime; at the end of two and one-half hours slight headache, marked vertigo, and difficulty in coördinating

movements of lower extremities. He slept soundly all night, awoke at usual time in the morning, but suffered all day with drowsiness, headache, vertigo, nausea, loss of appetite and general muscular relaxation. These symptoms persisted to a less degree during the two succeeding days. Urine normal.

CASE III.—J. W. E., man; aged 24; weight 128. Fifteen grains at 2 P. M., no effect; second afternoon same dose caused him to oversleep the next morning and feel dull for a part of forenoon; third afternoon *thirty* grains, drooping and puffiness of eyelids and rather a sleepy look but denial of any drowsiness; in the evening mild exhilaration, confused talkativeness, thickness of speech, inability to play his usually good game of cards, forgetfulness in dealing them and in the use of words. His companions remarked that he acted like a “drunken man.” After retiring he lay awake half an hour with severe headache, nausea and vertigo. His head seemed to make rapid rotations, then suddenly coming to a dead stop, to repeat these movements. He said that he never was more sick in his life. Sleep was prolonged in the morning and left him stupid and listless during the forenoon. Urine normal except distinct alkalinity and precipitation of phosphates for twenty-four hours after the thirty grain dose.

CASE IV.—O. C., man; aged 31; weight 160. Fifteen grains at 2 P. M., no effect; second afternoon same dose, distinct drowsiness and tightness through temples after four hours, in the evening slight vertigo and muscular relaxation; third afternoon *thirty* grains, within three-quarters of an hour marked drowsiness increasing for two hours so that great effort was required to keep awake. During the next three hours his sensations were entirely comfortable and such as would naturally be induced by intense desire of sleep. Thereafter this desire began to diminish and was succeeded by a group of very disagreeable symptoms. There ensued noticeable difficulty in coördinating movements of legs and arms and in speaking clearly, marked vertigo, nausea and four attacks of vomiting. The nausea and vomiting seemed directly dependent on the vertigo and would appear and disappear with it. The vertigo was excited or very much increased by closure of the eyes. He fell asleep at once on retiring, awoke at usual time in the morning but suffered two days in lessening degree from drowsiness, headache, vertigo, nausea, loss of appetite and muscular relaxation. Urine normal excepting alkalinity and

precipitation of phosphates which began seven hours after the thirty grain dose and continued twenty-four hours.

CASE V.—S. G. H., woman; aged about 30, weight 135. Ten grains at 2 P. M., no effect: second afternoon fifteen grains, no effect; third afternoon twenty-five grains, slight drowsiness, drooping and puffiness of eyelids late in the evening; in the morning vertigo and lassitude lasting into the afternoon. Her friends noticed that she looked paler than usual during the last two days under sulphonal. Urine not examined.

CASE VI.—R. E., woman; aged about 30; weight 125. Ten grains at 2 P. M., no effect until evening when she became so drowsy that she fell asleep with her clothes on and gas burning, and did not awake until 4.30 A. M., then hastily preparing for bed she again slept and required to be awakened for breakfast; second afternoon fifteen grains, within two hours marked drowsiness, vertigo, and nausea lasting two hours and followed by mild exhilaration until bedtime. She again overslept the next morning and felt stupid and relaxed during the forenoon, third afternoon twenty grains: at the end of an hour she was prostrated and obliged to sleep; while awake there were drooping and puffiness of eyelids, difficulty in coördinating movements of the extremities and in speaking clearly; headache, vertigo, nausea and mental confusion so as to prevent the performance of her customary duties. Her sleep was heavy during the night and prolonged in the morning. During the next forenoon she was compelled to take a nap lasting several hours and felt dull and miserable all day. Urine not examined.

In no instance was there material alteration in pulse, respiration, temperature, pupils, thirst, condition of skin, throat or bowels. Within three-quarters to one hour after maximum doses the inclination to sleep was marked in four cases, slight in two. The accompanying symptoms were drooping and puffiness of eyelids in five cases, headache in three, vertigo in four, nausea in three, vomiting in one, stimulation in two, mental confusion in two, motor disturbances in four and alkalinity of urine in two; after-effects were slight in three cases and confined to hebetude, vertigo and lassitude which disappeared in one day; marked in the other three were somnolence, headache, vertigo, nausea, loss of appetite and muscular relaxation lasting one to three days. In four cases equal doses were administered twice in succession with increase of efficiency in three of them.

It is probable, so far as this limited number of observations may show, that sulphonal is a reliable hypnotic in the majority of quiet or mildly agitated cases of insanity; that motor excitement impairs its action; that the dose is variable, especially in women, and should be graduated to suit the individual; that in persons of average strength ten grains for women or fifteen for men are not excessive initial doses; that disagreeable symptoms may follow twenty grains in women or thirty grains in men and that amounts much beyond thirty grains are of doubtful utility.